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**Craig, A., Y., Charles Evans & Associates XPS/ESCA  
Results, CE&A Number 44545, November 3, 1994**

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# CHARLES EVANS & ASSOCIATES

SPECIALISTS IN MATERIALS CHARACTERIZATION

FACSIMILE COMMUNICATION • FACSIMILE COMMUNICATION • FACSIMILE COMMUNICATION

COMPANY: Hydrocatalysis Power  
 ATTENTION: Stev Bollinger  
 DESTINATION  
 FAX NO: (610) 651-4940  
 FROM: Dr. A.Y. Craig  
 SUBJECT: XPS/ESCA Results (CEA #44545)

REF NO: G9942

DATE: November 3, 1994

PAGE 1 OF 7

CE&A REPLY FAX  
 NO: (415) 369-7921

Please find attached typical results for your samples. A 2 mm x 0.8 mm analysis area was selected for this work.

Elements C, O, N, Si, Cl, S, Ni, Zn, Sn, K, Ca, Mg and Cr are detected at the surface for the Nickel Cathode Sample #A. The concentration for C is approximately 52 at%, while that for Ni is approximately 9 at%. The concentrations for Ca (approximately 0.1 at%) and Mg (approximately 0.2 at%) are considered maximum values due to the noisy spectra.

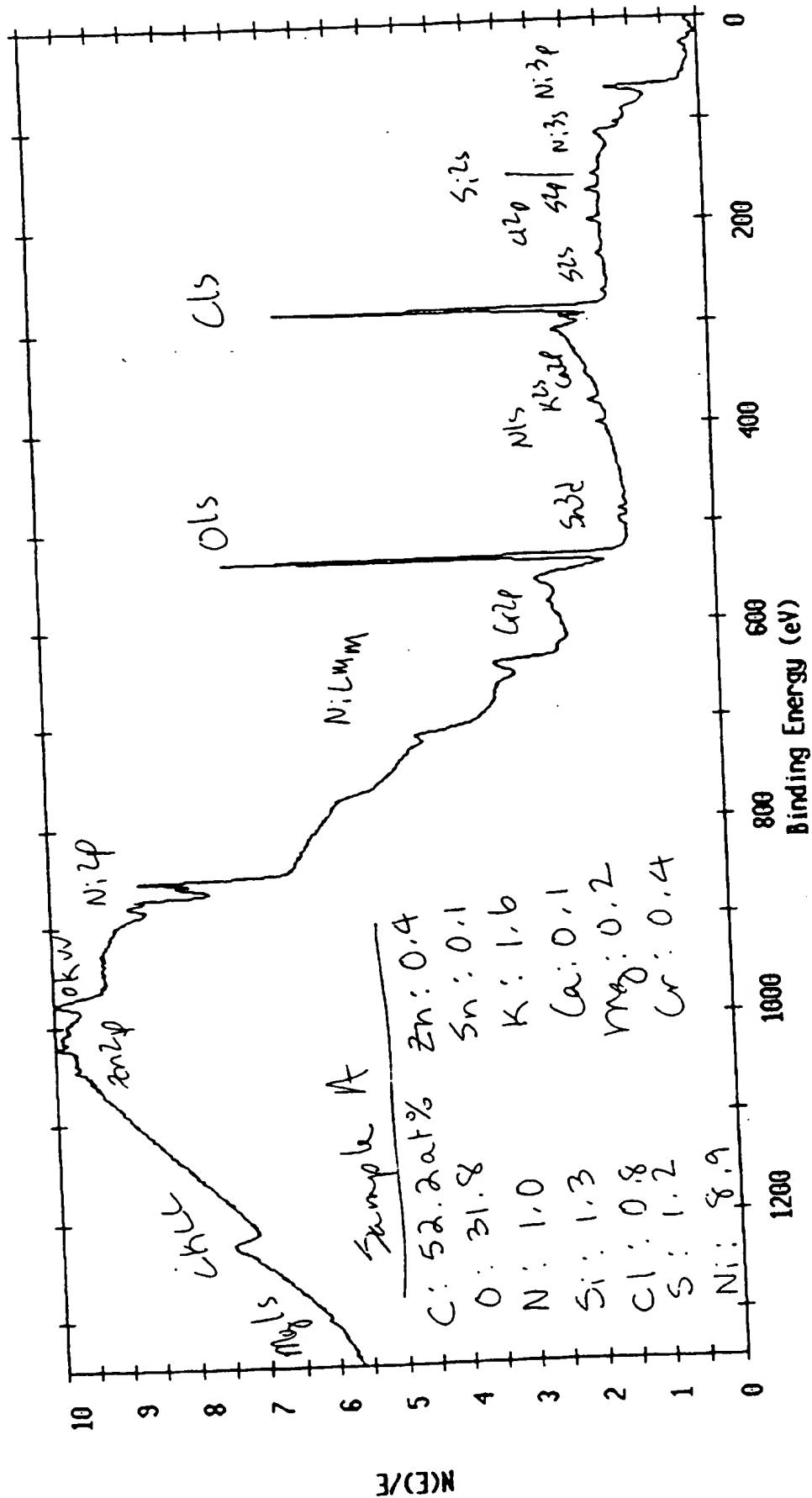
Elements C, O, N, Si, S, Ni, Zn, Sn, Mg and Cr are detected at the surface for the Nickel Cathode Sample #B. The concentration for C is approximately 41 at%, while that for Ni is approximately 13 at%.

This analysis involved approximately 8 hours of instrument time. You will be invoiced for 6 hours (\$1800.00), as quoted. If you have any questions regarding this work, please call me.

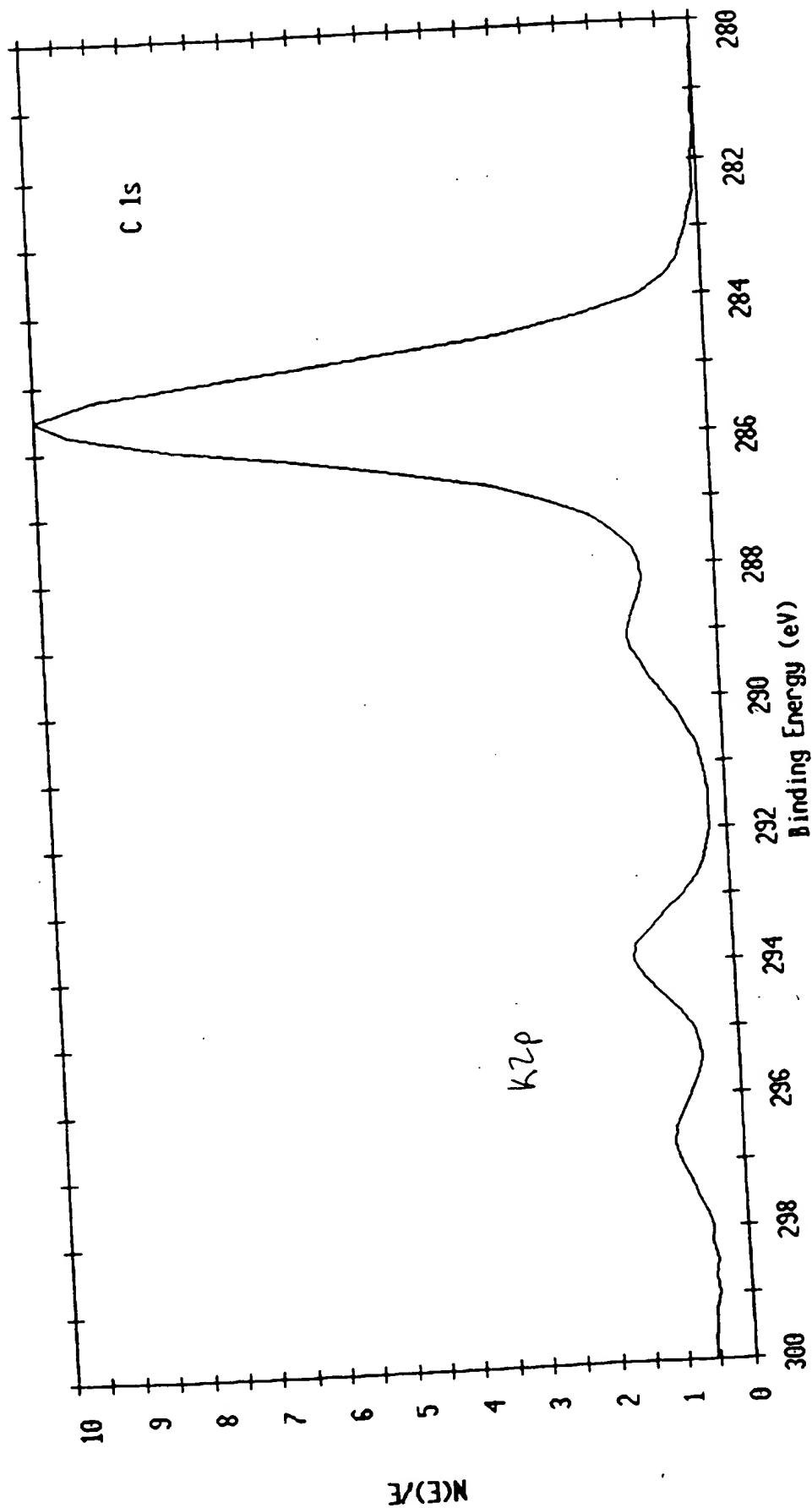
Sincerely,

Angela Y. Craig

ESCA Survey 1 Nov 94 Angle: 45 degrees Acquisition Time: 29.82 min  
 File: HYDROCAT10 SAMPLE A  
 Scale Factor: 29.950 kc/s Offset: 7.175 kc/s Pass Energy: 187.850 eV Aperture: 5 #1 450 μ  
 (2)

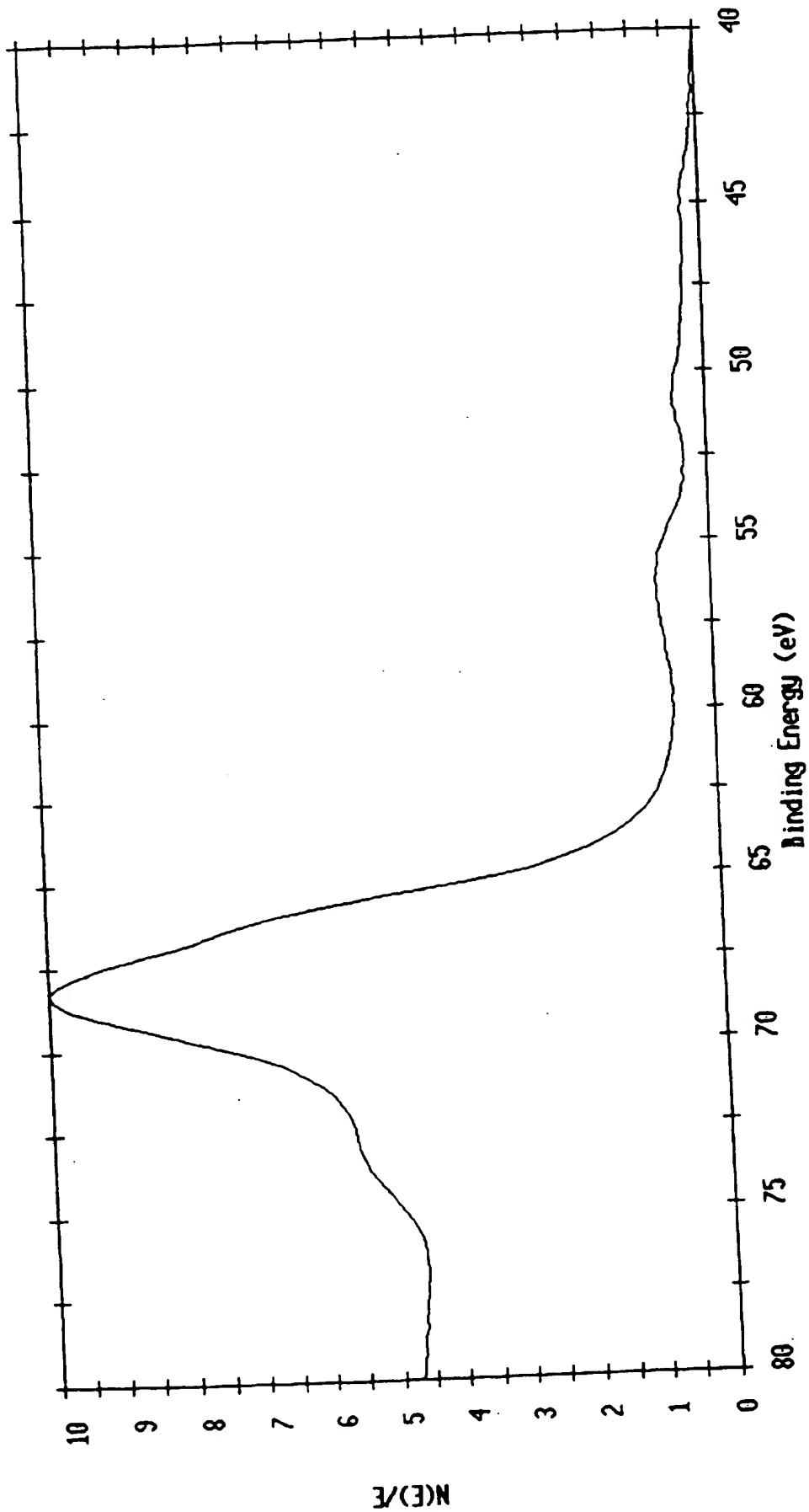


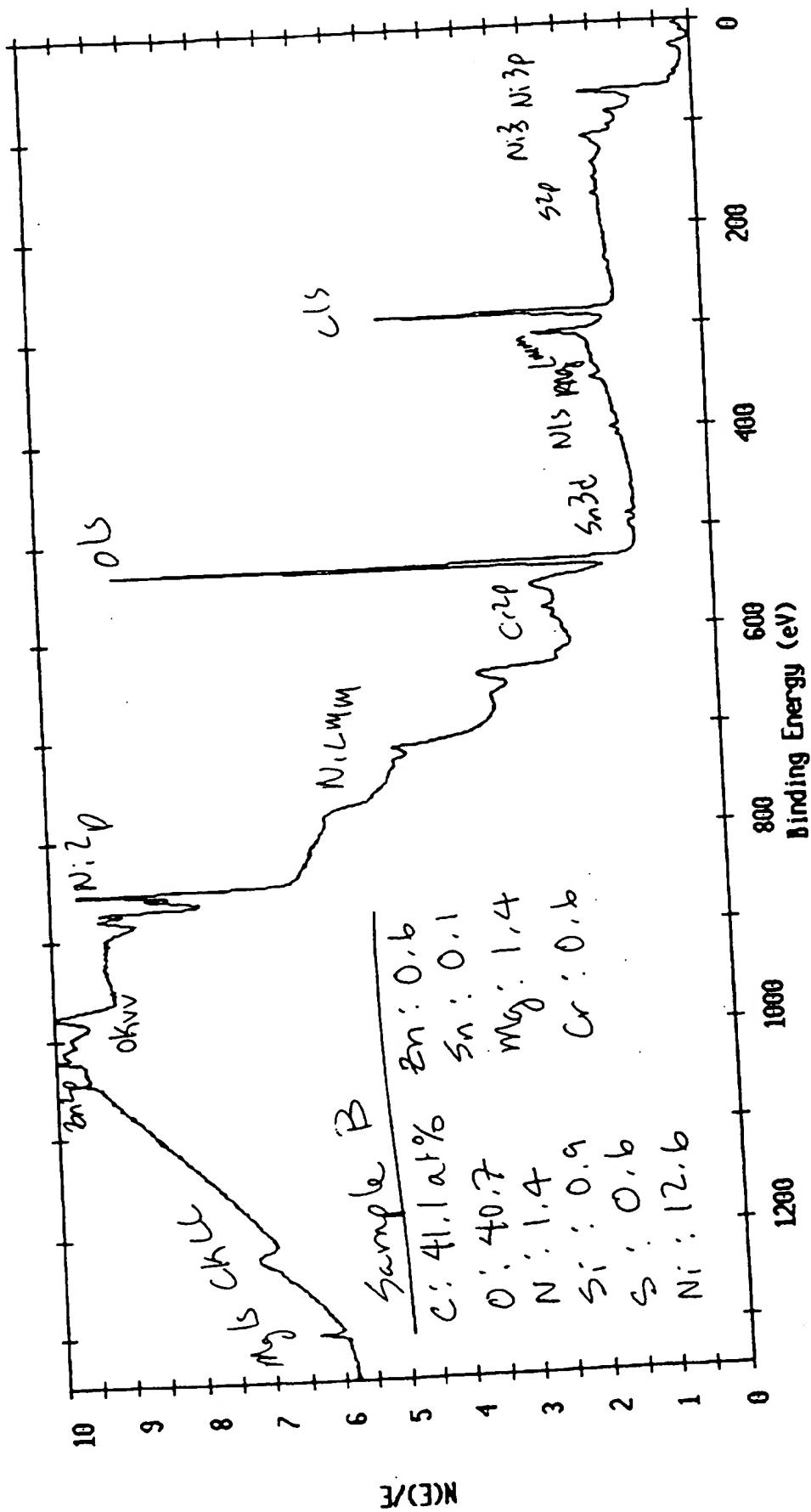
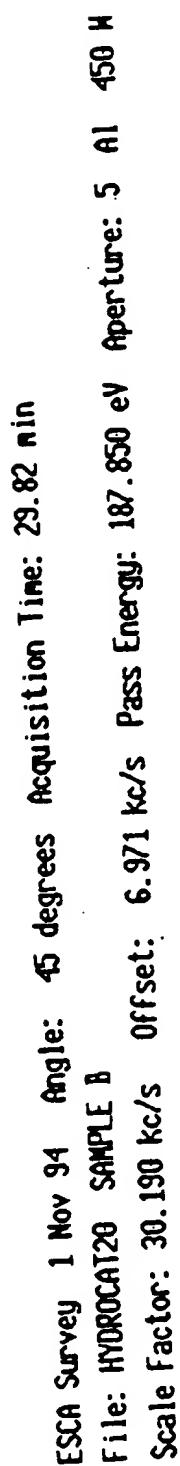
ESCA Multiplex 1 Nov 94 Species: Cl Region: 1 Angle: 45 degrees Acquisition Time: 2.09 min  
 SAMPLE A  
 File: HYDROCAT11  
 Scale Factor: 6.336 kc/s Offset: 13.449 kc/s Pass Energy: 58.700 eV Aperture: 5 Al 450 K



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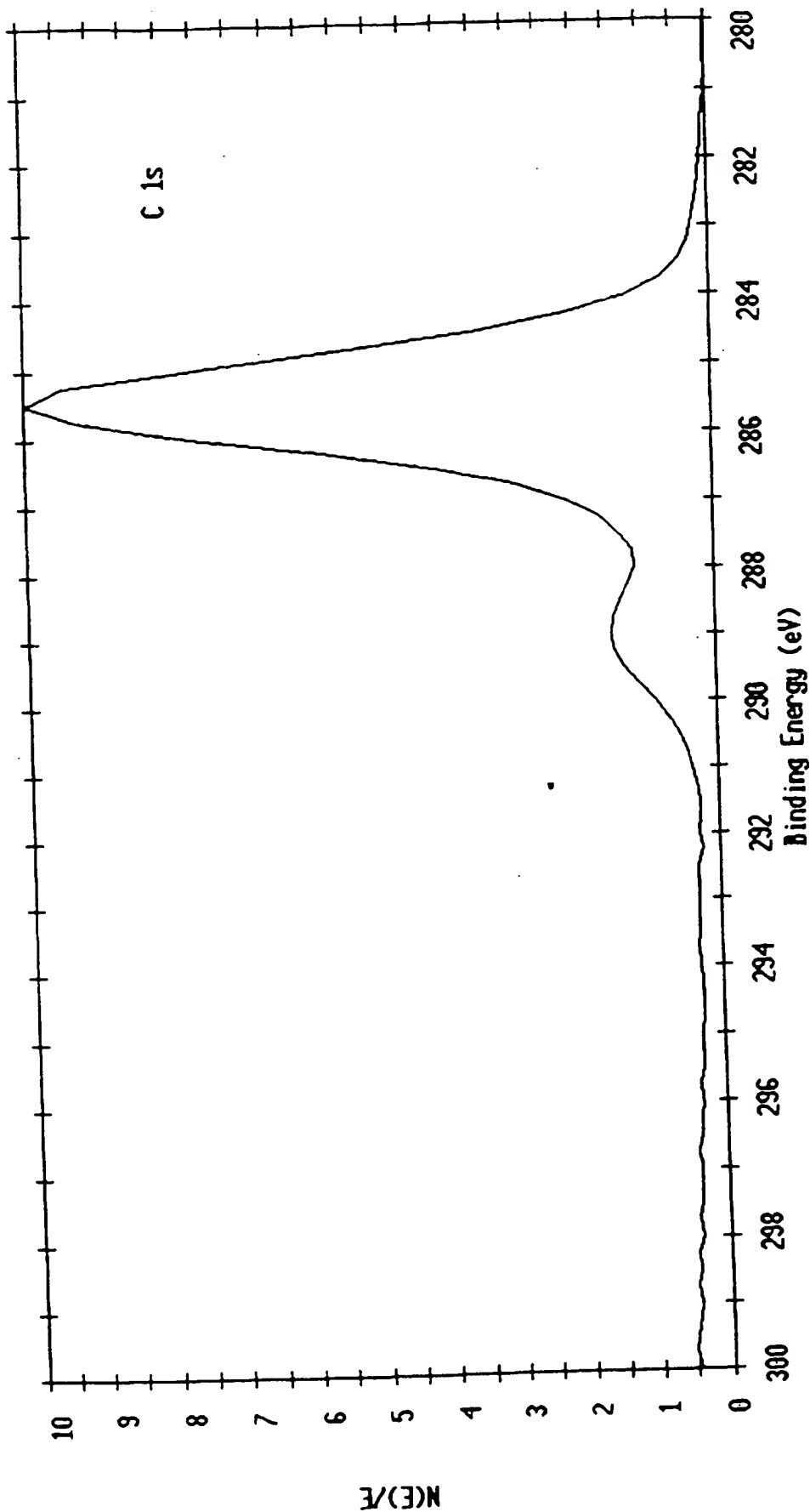
ESCA Multiplex 1 Nov 94 Species: Fe3 Region: 2 Angle: 45 degrees Acquisition Time: 116.46 min  
File: HYDROCAT11 SAMPLE A  
Scale Factor: 1.290 kc/s Offset: 3.150 kc/s Pass Energy: 58.700 eV Aperture: 5 Al 450  $\mu$





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ESCA Multiplex 1 Nov 94 Species: C1 Region: 1 Angle: 45 degrees Acquisition Time: 2.09 min  
File: HYDROCAT21 SAMPLE B  
Scale Factor: 4.695 kc/s Offset: 12.191 kc/s Pass Energy: 58.700 eV Aperture: 5 A1 450  $\mu$



11/03/94

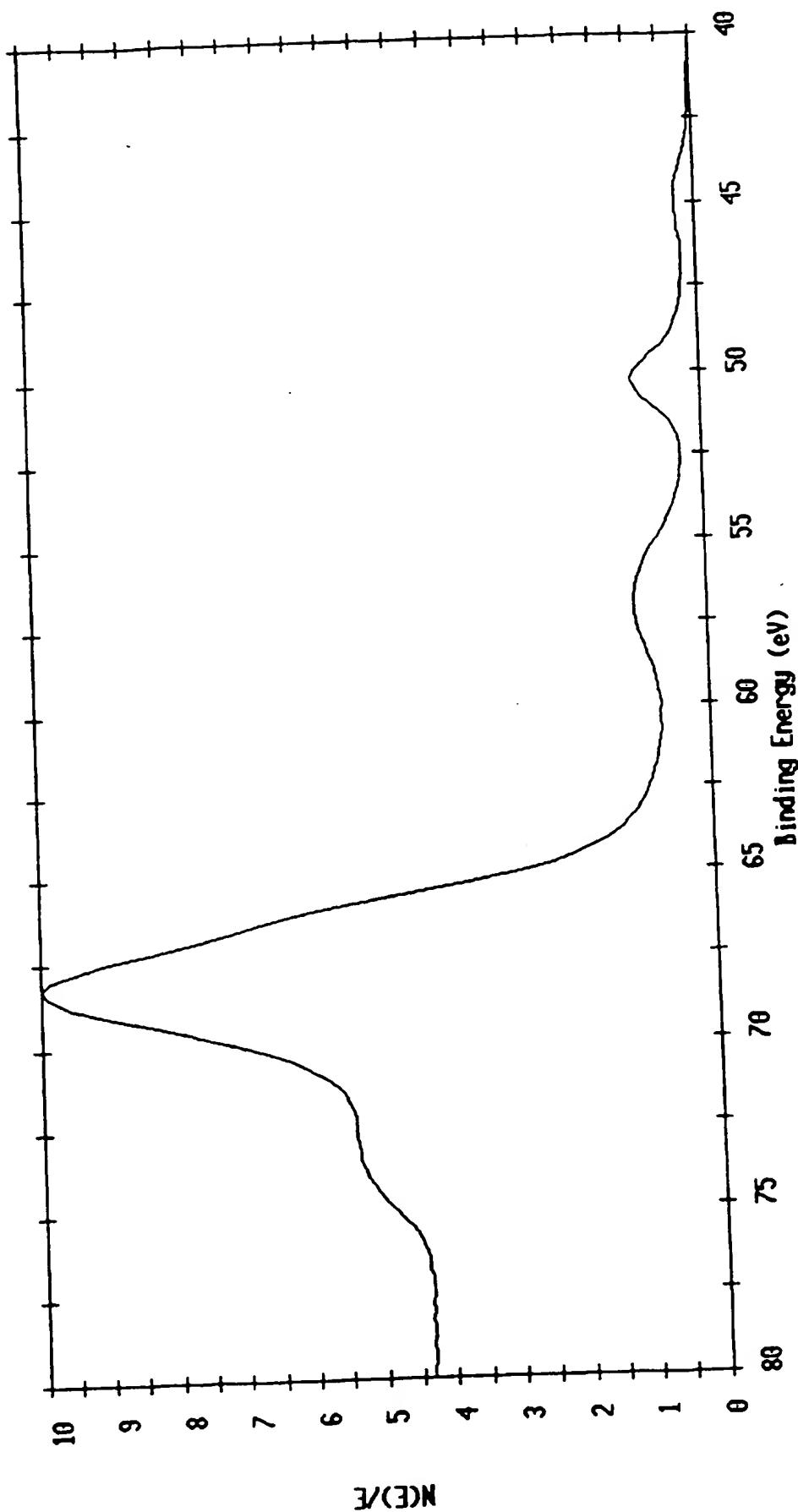
17:29

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ESCA Multiplex 1 Nov 94 Species: Fe3 Region: 2 Angle: 45 degrees Acquisition Time: 116.46 min  
File: HYDROCAT21 SAMPLE 11  
Scale Factor: 1.536 kc/s Offset: 2.987 kc/s Pass Energy: 58.700 eV Aperture: 5 Al 450 W



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